Fig. 1 Client interaction with a Web server using HTTP
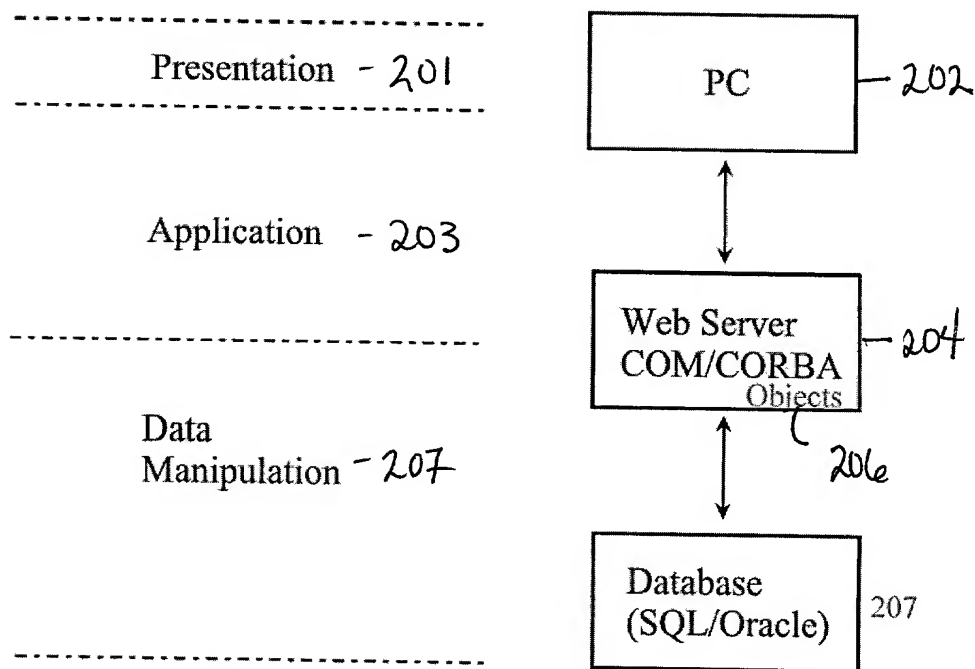

Fig. 2 Three-tier client server system
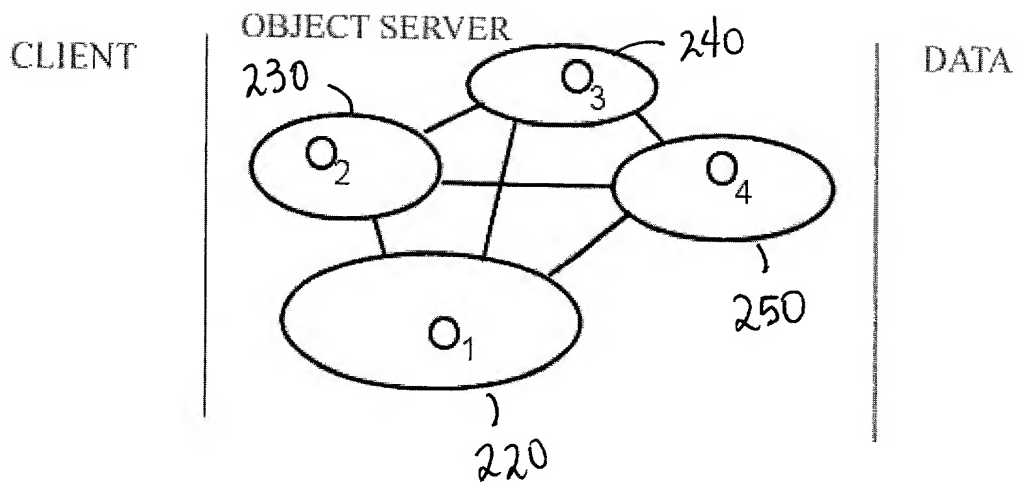
CLIENT | OBJECT SERVER | DATA

O_3 — 240

230 — O_2

O_4

250

O_1

220

FIG. 2B

TextBox *301*	Field Name: *305*	Input Box: *316* [1x20 ▾] *317*	Add *312*
CheckBox *302*	Field Name: *306*	Sub Name: *309*	Add *313*
OptionButt *303*	Field Name: *307*	Sub Name: *310*	Add *314*
SelectBox *304*	Field Name: *308*	Sub Name: *311*	Add *315*

New Form

Make Active *318*

FIG. 3

Video Film Library

Film Name	
Release Date	
Country	USA
Description	
Type	Sci-Fi ☐ Horror ☐ Comedy ☐ Adventure ☐ Musical ☐ Romance ☐
Pict. Quality	Good ⦿ Average ○ Poor ○
Rating	Excellent
	Clear Add

FIG. 4
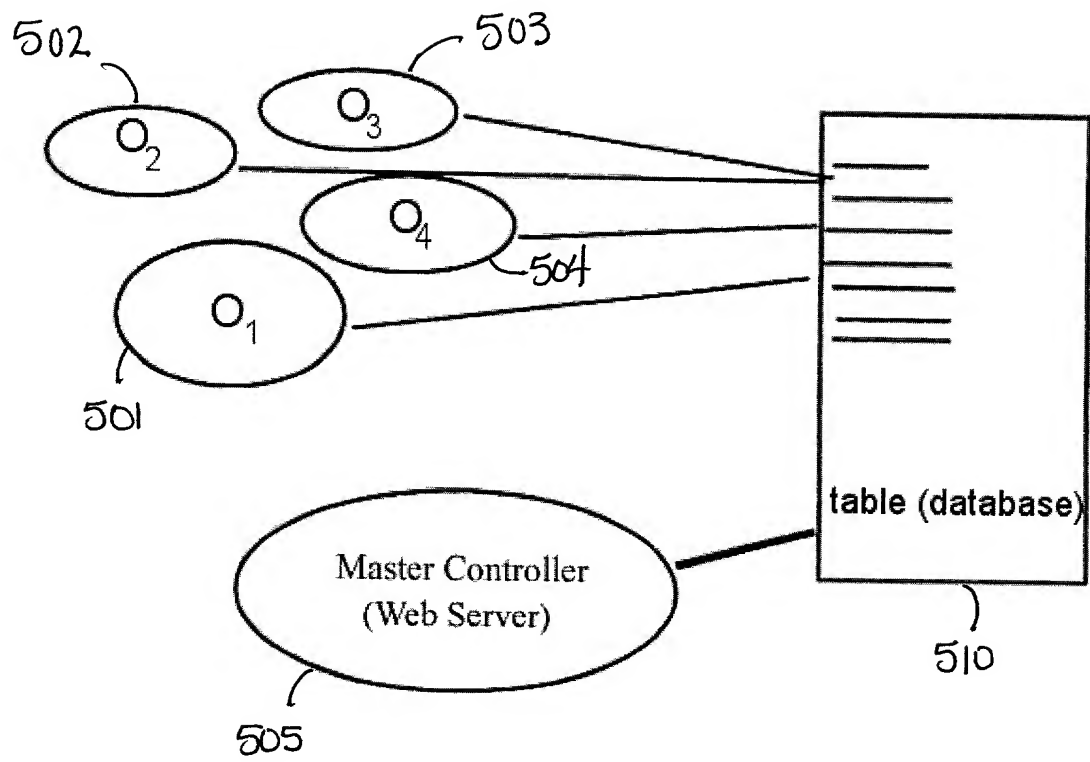
FIG. 5A

515

Client | Server   Objects

table or
other software
container

object 1 state

_____

_____

Web
Server   object 2 state

— — —

— — —

FIG. 5B

Code Figure

```
1. function add_field2(){
2.
3. //create the checkbox cookie
4.
5.      form_text = document.frmHead2.text1.value
6.      form_size = document.frmHead2.text2.value
7.
8.      new_cookie = "cookie" + tot_cookies.toString()
9.
10.     tot_cookies = parseInt(tot_cookies) + 1
11.         //set the total app. variables held in cookies
12.             setCookie("total_cookies", tot_cookies)
13.         //create the new form variable and store as a new cookie
14.             new_cookie_str = "T" + "`" + form_text + "`" + form_size
15.             setCookie(new_cookie, new_cookie_str)
16.
17.     window.location.reload()
18.
19. }
```

FIG. 6

Code Figure

```
1.      for (var c=0; c<tot_cookies; c++){
2.
3.      conv = (c+1).toString()
4.
5.      if (data_sets[c][0]=="T"){
6.                      //alert("this is a text box")
7.      //begin
8.                          items_coll = c.toString()
9.
10.         dstr += "<tr>"
11.         dstr += "<td>"
12.         dstr += data_sets[c][1]
13.         dstr += "</td>"
14.         dstr += "<td >"
15.         dstr += input_box(data_sets[c][2])
16.         dstr += "</td>"
17.         dstr += "<td><a name=\"conv\" href='javascript:if(confirm(\"Delete,
are you sure?\"))"
18.         dstr += "{del_line(" + items_coll + ")}else{}'>delete</a></td>"
19.         dstr += "</tr>"
20.
21.     }
22.     // draw for a radio button
23.     if (data_sets[c][0]=="R"){
24.     ...
25.     ...
26.     ...
27.     } //end of the for loop
28.
29.                     document.write (dstr)
```

FIG. 7

Code Figure

```
1.      for c = 0 to (tot_cookies-1)
2.              cookie_str = "cookie" + Cstr(c)
3.              vstr = vstr + Request.Cookies(cookie_str) + "^AAA^"
4.      next
5.
6.      objRec.AddNew
7.              objRec("customer_id") = cust_id
8.              objRec("customer_form") = form_id
9.              objRec("customer_name") = cust_name
10.             objRec("customer_email") = cust_email
11.             objRec("form_schema") = vstr
12.
13.             objRec.Update
```

FIG. 8

Code Figure

```
1.    'build the Javascript array to include all the returned data_sets
2.
3.                vstr = vstr + "<script LANGUAGE='JavaScript'>" + Chr(13)
4.
5.    'define the array variables
6.            vstr = vstr + "var data_sets = new Array(2)" + Chr(13)
7.
8.    for a = 1 to rec_no
9.            vstr = vstr + "data_sets[" + Cstr(a) +  "] = new Array(20)" + Chr(13)
10.   next
11.
12.   'populate the array with the values
13.           for a = 1 to rec_no
14.               for b =1 to form_row
15.                   vstr = vstr + "data_sets[" + Cstr(a) + "][" + Cstr(b) + "] =
" + """ + Cstr(data_sets(a,b)) + """ + Chr(13)
16.               next
17.           next
18.
19.               vstr = vstr + "</script>"
20.
21.               Response.Write vstr
```

FIG. 9

client requests
operation on a
saved form

520

server

505

table holding
application state

client form A

530

client requests
data stored
using this form

535

server reserves
space in table
and holds
data collection

540

client form A
— — —
— — —
data sent

}data collection

545

client works with
the returned data
collection
packaged as a
javascript array

550

FIG. 5C

Client | Server

Object 1 - <u>557</u>

 object 1 source code - <u>555</u>

  — — —

   — — —

  — — —

Object 2 - <u>558</u>

 object 2 source code - <u>556</u>

  — — —

   — — —

  — —

Web Server

table or
other software
container

FIG. 5D

Load Balancer ——560

571

566
570

Objects

568

Web
Server ——562 572

Multi-
Processor ——561
Systems

Web
Server ——563

567

569

Database
Instance

Database
Instance

564

565

Redundant
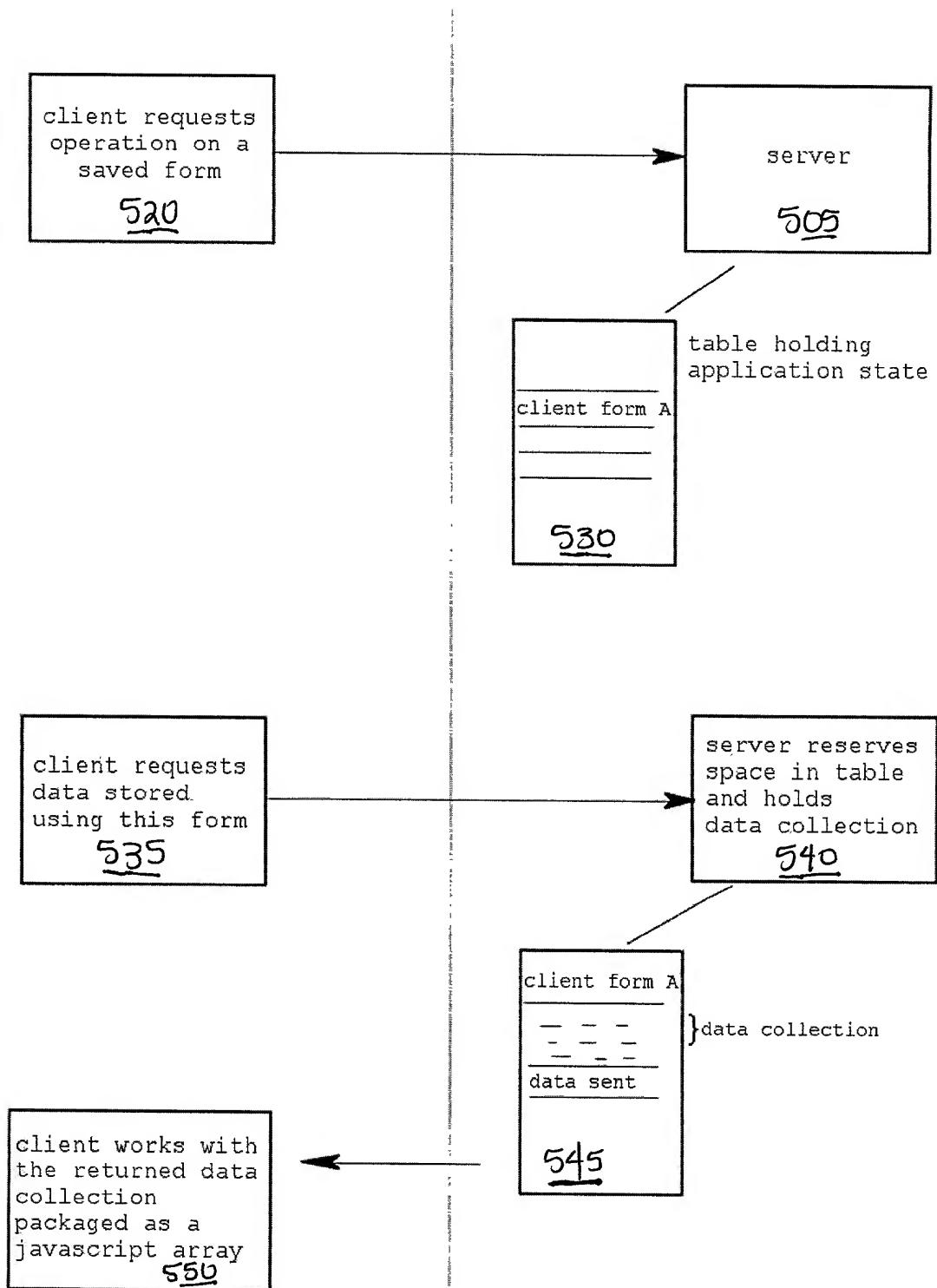Storage
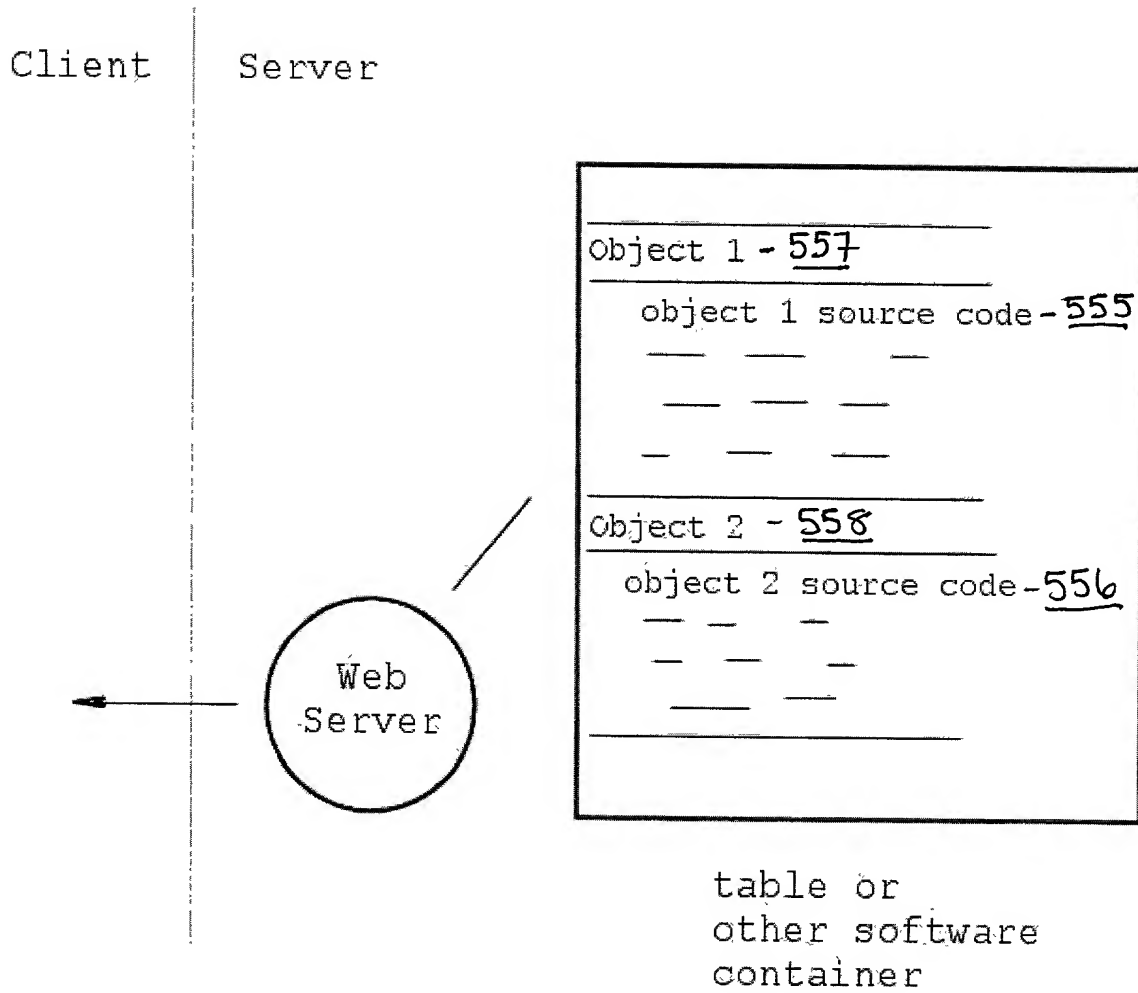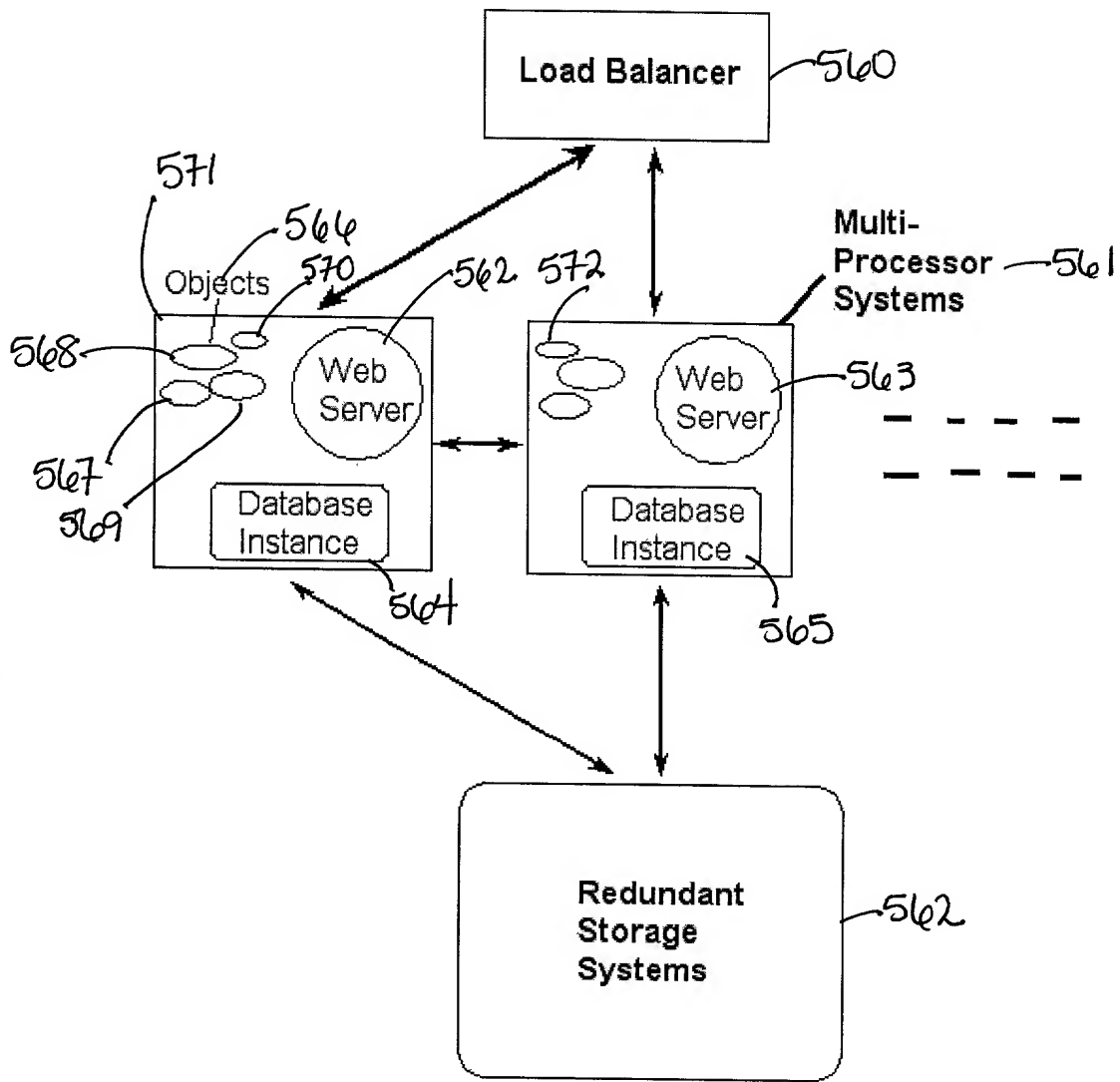Systems ——562

FIG. 5E

Client user accesses
HTML page   ~601

Client creates form
using an .html template   ~602

User/Client submits
form   ~603

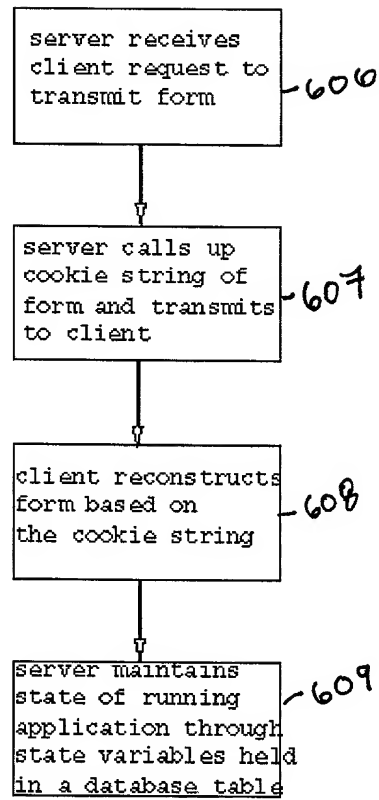Server stores form
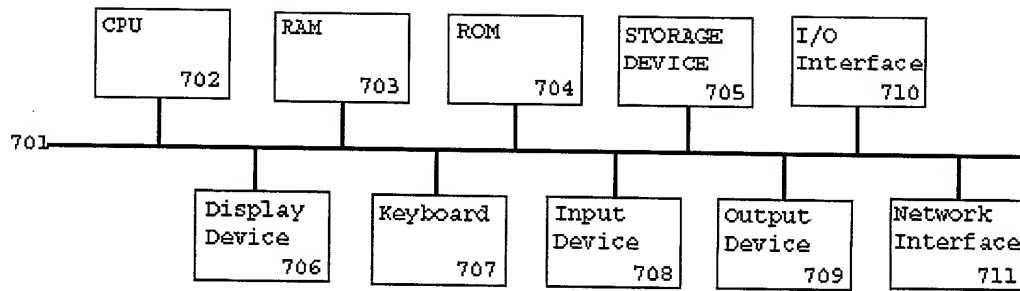in database table   ~604

FIG. 10

server receives
client request to
transmit form — 606

server calls up
cookie string of
form and transmits
to client — 607

client reconstructs
form based on
the cookie string — 608

server maintains
state of running
application through
state variables held
in a database table — 609

FIG. 11

700

↓

CPU 702	RAM 703	ROM 704	STORAGE DEVICE 705	I/O Interface 710

701

Display Device 706	Keyboard 707	Input Device 708	Output Device 709	Network Interface 711

FIG. 12

FIG. 13